



## Original Article

# RISK FACTORS ANALYSIS IN ASPHYXIATED NEWBORN AND THEIR NEUROLOGICAL OUTCOME IN RELATION TO HYPOXIC-ISCHAEMIC ENCEPHALOPATHY

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### Abstract

**Background:** Perinatal mortality rate in the developing world is still significantly higher than what obtained in the individualized nation<sup>1</sup>. Perinatal asphyxia has been established as one of the major causes of these deaths. Perinatal asphyxia is a serious clinical problem world wide. There are various reasons of failure to initiate and sustain breathing immediately after birth.

Neurological complication like hypoxic ischaemic encephalopathy (HIE) following damage to the brain is very frequent and commonly seen in asphyxiated newborn .

**Objective:** To find out the risk factors and the hospital outcome with special emphasis on HIE following perinatal asphyxia.

**Methods:** It was a retrospective study on 92 (ninety two) consecutive cases of perinatal asphyxia admitted in the neonatal care unit of Sir Salimullah Medical College and Mitford Hospital during the period of January and February 2011.

**Results:** The results revealed that during the study period the number of perinatal asphyxia in admitted in neonatal care unit was 92 out of 193 i.e. 47.6%. Out of 92 asphyxiated newborn 86% were admitted in first 24 hours of life. Among them 71% were inborn and of male sex. Most of them (69%) were of normal birth weight. Regarding gestational age 56% were term. Fifty one percent were delivered per vaginally. Majority of mothers

(79%) received antenatal care. Intrapartum risk factors included premature rupture of membrane (PROM) 19%, prolonged labour 15%, pregnancy induced hypertension 13%, antepartum haemorrhage 13%, preeclampsia and eclampsia 10%, obstructed labour 10%, malpresentation 8%, multiple gestation 8%. 60% mothers had multiparity. Presenting complaints were respiratory distress characterized by tachypnea /chest indrawing (30%), grunting (25%), convulsion (21%), irritability or excessive crying (9%), poor feeding or sucking (8.6%). About neurological complications 45% developed hypoxic ischaemic encephalopathy. Out of 42 HIE cases 60% had grade II encephalopathy. Grade I HIE was found in 26% of cases and 14% cases had grade III or severe encephalopathy. About hospital outcome 58% had hospital stay for minimum 5 days and 63% were discharged after improvement Thirteen percent were discharged on risk bond. 22 cases died during hospitalization

**Conclusion & Recommendation:** The rate of hospital admission of Perinatal asphyxia as well as Neurological complication like hypoxic ischemic encephalopathy (HIE) was very high though majority of mother received antenatal care and affected newborns were inborn. So proper attention and timely intervention as well as resuscitation of newborn delivered in the hospital is essential to prevent the unwanted neurological complication of Perinatal asphyxia like HIE as well as other morbidity and fatality.

**Key words:** Perinatal asphyxia, hypoxic ischaemic encephalopathy, newborn.

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### Introduction

Perinatal mortality rate in the developing world is still significantly higher than what obtained in the individualized nation<sup>1,2</sup>. Perinatal asphyxia has been established as one of the major causes of these

deaths<sup>3,4</sup>. Perinatal asphyxia is a serious clinical problem world wide. Each year approximately 4 million babies are born asphyxiated which results in one million deaths and an equal number of serious neurological complications, such as cerebral palsy, mental retardation and epilepsy<sup>5</sup>. These problems create a great burden for the family as well as for the society. According to World Health Organization estimates, in the developing countries 35% of all infants (3.6 million) suffer from moderate to severe birth asphyxia; of which 23% (840000) die and approximately the same number developed serious complication<sup>6</sup>.

Prevention is more important than treatment. In a poor country like Bangladesh the need for risk assessment of birth asphyxia is thus obvious<sup>7</sup>. So this study was designed.

**Objective:** To find out the risk factors and the hospital outcome with special emphasis on HIE following perinatal asphyxia.

**Methods:**

It was a retrospective study on 92 consecutive cases of perinatal asphyxia admitted in the neonatal care unit of Sir Salimullah Medical College and Mitford Hospital during the period of January and February 2011.

**Results:**

**Table I**

*Characteristics of newborn with perinatal Asphyxia*

Features	Number	Percentage (%)
Admitted in 1 <sup>st</sup> 24 hours	80	86
Sources of cases		
Inborn	66	71.74
Outborn	26	28.26
Mode of delivery		
Vaginal	47	51.09
Cesarean section	45	48.91
Gestational age		
Preterm	35	38.04
Term	52	56.52
Post term	5	5.43

**Table II**

*Distribution of sex*

Sex	Number (%)	Percentage (%)
Male	66	71.74
Female	26	28.26

**Table III**

*Distribution of birth weight*

	Normal		Low	
	No	%	No	%
Birth weight	64	69.57	28	30.43

**Table IV**

*Base line data of mothers of affected newborn*

	Number	Percentage(%)
ANC		
Received	73	79.35
Not received	19	20.65
Parity		
Primi	36	39.13
Multi	56	60.87

**Table V**

*Antepartum and Intrapartum risk factors*

Factor	Number	Percentage (%)
PROM	18	19
Prolonged Labour	14	15
PIH	12	13
APH	12	13
PE,Eclampsia	10	10
Malpresentation	8	8
Multiple gestation	8	8

**Table VI**

*Presenting complaints*

	Number	Percentage (%)
Respiratory distress	28	30
Grunting	23	25
Convulsion	20	21
Irritability/ Excessive crying	9	9
Poor feeding/Sucking	8	8

**Table VII**  
*Grades of Hypoxic Ischaemic encephalopathy*

Grade I	11	26
Grade II	25	60
Grade III	6	14

**Table VIII**  
*Number of cases by outcome*

	Number	Percentage (%)
Hospital stay at least for 5 days	54	58.69
Discharge	58	63.04
DORB	12	13.04
Death	22	23.91

The results revealed that during the study period the number of perinatal asphyxia in admitted cases of neonatal care unit was 92 out of 193 i.e. 47.6%. Out of 92 asphyxiated newborn 86% were admitted in first 24 hours of life. Among them 71% were inborn and of male sex. Most of them (69%) were of normal birth weight. Regarding gestational age 56% were term. Fifty one percent were delivered per vaginally. Majority of mothers (79%) received antenatal care. Intrapartum risk factors included premature rupture of membrane (PROM) 19%, prolonged labour 15%, pregnancy induced hypertension 13%, antepartum haemorrhage 13%, preeclampsia and eclampsia 10%, obstructed labour 10%, malpresentation 8%, multiple gestation 8%. 60% mothers had multiparity. Presenting complaints were respiratory distress characterized by tachypnea /chest indrawing (30%), grunting (25%), convulsion (21%), irritability or excessive crying (9%), poor feeding or sucking (8.6%). About neurological complications 45% developed hypoxic ischaemic encephalopathy. Out of 42 HIE cases 60% had grade II encephalopathy. Grade I HIE was found in 26% of cases and 14% cases had grade III or severe encephalopathy. About hospital outcome 58% had hospital stay for minimum 5 days and 63% were discharged after improvement Thirteen percent were discharged on risk bond. Twenty two Cases died during hospitalization

#### **Discussion:**

This study was an analysis of risk factors and hospital outcome of newborn with perinatal asphyxia admitted

in neonatal care unit of SSMC Mitford Hospital The number of studies done so far in Bangladesh in this regard was only a few as reported from Dhaka Shishu Hospital ( BICH) and BSMMU<sup>8,9</sup>. In this study male female ratio was 2.4:1. Among the asphyxiated cases important maternal antepartum and intrapartum risk factors more frequently encountered were PROM, Prolonged labour, PIH, APH, Preeclampsia, eclampsia. These findings are consistent with many other studies<sup>10,11</sup>.

In this study 56.5% of the asphyxiated babies were term, 38% were preterm and 5.4% were post term. Ergander also found similar result in a study of 116 cases of severe asphyxia <sup>12</sup>.

In our study mean birth weight was 2.7 kg which is nearer to the value found in the study of Gold berg <sup>13</sup>. Death rate was found to be 23.9% in the asphyxiated babies. Mortality seen in the study of Khatoon in 1989 was 25.4%<sup>10</sup>. So the result is consistent with this study.

The neurological complication observed in the present study were HIE in 45% cases. It is similar to the study of Shirin<sup>14</sup>. Out of 42 HIE cases 60% had grade II encephalopathy. Grade I was found in 26% cases and 14% case had grade III or severe encephalopathy.

#### **Conclusion & Recommendation:**

The rate of hospital admission of Perinatal asphyxia as well as Neurological complication like hypoxic ischemic encephalopathy (HIE) was very high though majority of mother received antenatal care and affected newborns were inborn. So proper attention and timely intervention as well as resuscitation of newborn delivered in the hospital is essential to prevent the unwanted neurological complication of Perinatal asphyxia like HIE as well as other morbidity and fatality.

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